

IN THE CLAIMS

1. (Currently Amended) An apparatus for measuring a parameter of a process flow flowing within a pipe, the apparatus comprising:

a first meter portion for providing a ~~meter-measurement~~ signal indicative of a parameter of the flow propagating through the pipe;

a second meter portion including a sensor for providing sound measurement signal indicative of the speed of sound propagating within the pipe; and

a processor for providing a compensated ~~meter-measurement~~ signal indicative of ~~a-the~~ measurement signal parameter corrected-compensated for entrained gas in the process flow propagating through the pipe, in response to ~~meter-measurement~~ signal and the sound measurement signal.

2. (Currently Amended) The apparatus of claim 1, wherein the second meter portion includes at least two ~~pressure-strain~~ sensors at different axial locations along the pipe, each of the ~~pressure strain~~ sensors providing a respective ~~pressure-strain~~ signal indicative of ~~a-acoustic~~ pressure disturbance-disturbances within the pipe at a corresponding axial position, wherein the processor, responsive to said pressure signals, provides the sound measurement signal. ~~a-signal indicative of the gas volume fraction of the process flow flowing within the pipe.~~

2. (Canceled)

3. (Currently Amended) The apparatus of claim 1, wherein the first meter portion includes at least two ~~pressure-strain~~ sensors at different axial locations along the pipe, each of the ~~pressure strain~~ sensors providing a respective ~~pressure-strain~~ signal indicative of ~~a-vortical~~ pressure disturbance-disturbances within the pipe at a corresponding axial position, wherein the processor, responsive to said ~~pressure-strain~~ signals, provides a signal indicative of a parameter of the process flow flowing within the pipe. ~~the volumetric flow of the process flow flowing within the pipe.~~

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4. (Currently Amended) The apparatus of claim 1, wherein the first meter portion is a volumetric flow meter and the ~~meter~~-measurement signal is indicative of the volumetric flow of the process flow.

5. (Original) The apparatus of claim 4, wherein the volumetric flow meter is an electromagnetic flow meter.

6. (Currently Amended) The apparatus of claim 1, wherein the first meter portion is a consistency flow meter and the ~~meter~~-measurement signal is indicative of the consistency of the process flow.

7. (Original) The apparatus of claim 6, wherein the consistency meter is a microwave consistency meter.

8. (Currently Amended) The apparatus of claim ~~1~~, 2, wherein the processor determines the slope of an acoustic ridge in the ~~k-w~~k- ω plane to determine the sound measurement signal, a parameter of the process flow flowing in the pipe.

9. (Canceled)

10. (Currently Amended) The apparatus of claim ~~9~~, 3, wherein the parameter of the fluid is one of velocity of the process flow and the volumetric flow of the process fluid.

11. (Currently Amended) The apparatus of claim ~~1~~, 3, wherein the processor determines the slope of a convective ridge in the ~~k-w~~k- ω plane to determine the velocity of the fluid flowing in the pipe.

12. (Canceled)

13. (New) The apparatus of claim 1, wherein the processor provides a signal indicative of the gas volume fraction of the process flow in response to the sound signal measurement.

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14. (New) The apparatus of claim 1, wherein the compensated measurement is indicative of the volumetric flow rate of the non-aerated portion of the process flow.

15. (New) The apparatus of claim 14, wherein the compensated measurement signal is determined by $Q_{\text{comp}} = Q_{\text{meas}}(1 - \phi)$, where Q_{comp} is the compensated measurement signal, Q_{meas} is the measurement signal, and ϕ is the gas volume fraction of the process flow.

16. (New) The apparatus of claim 1, wherein the measurement signal is indicative of the consistency of the process flow flowing in the pipe.

17. (New) The apparatus of claim 1, wherein the compensated measurement is indicative of the consistency of the non-aerated portion of the process flow.

18. (New) The apparatus of claim 17, wherein the compensated measurement signal is determined by $Q_{\text{comp}} = Q_{\text{meas}}(1 - R\phi)$, where Q_{comp} is the compensated measurement signal, Q_{meas} is the measurement signal, R is a compensation factor, and ϕ is the gas volume fraction of the process flow.

19. (New) The apparatus of claim 17, wherein the compensation factor is 1.4.

20. (New) The apparatus of claim 1, wherein the process flow is one of a liquid having entrained gas, a mixture having entrained gas, a liquid-liquid mixture having entrained gas, a liquid-solid mixture having entrained gas, and a slurry having entrained gas.

21. (New) The apparatus of claim 1, wherein the processor may be included with at least one of the first meter portion, the second meter portion and separate from the first and second meter portion.

22. (New) A method for measuring a parameter of a process flow flowing within a pipe, the method comprising:

receiving a measurement signal indicative of a parameter of the flow propagating through the pipe;

receiving a sound measurement signal indicative of the speed of sound propagating within the pipe; and

determining a compensated measurement signal indicative of the measurement signal compensated for entrained gas in the process flow, in response to the measurement signal and the sound measurement signal.

23. (New) The method of claim 22, further including;

measuring the measurement signal indicative of a parameter of the process flow propagating through the pipe; and

measuring a sound measurement signal indicative of the speed of sound propagating within the pipe.

24. (New) The method of claim 22, further includes determining a signal indicative of the gas volume fraction of the process flow in response to the sound signal measurement.

25. (New) The method of claim 22, wherein the measurement signal is indicative of the volumetric flow rate of the process flow flowing in the pipe.

26. (New) The method of claim 25, wherein the compensated measurement signal is indicative of the volumetric flow rate of the non-aerated portion of the process flow.

27. (New) The method of claim 26, wherein the compensated measurement signal is determined by $Q_{\text{comp}} = Q_{\text{meas}}(1 - \phi)$, where Q_{comp} is the compensated measurement signal, Q_{meas} is the measurement signal, and ϕ is the gas volume fraction of the process flow.

28. (New) The method of claim 22, wherein the measurement signal is indicative of the consistency of the process flow flowing in the pipe.

29. (New) The method of claim 28, wherein the compensated measurement is indicative of the consistency of the non-aerated portion of the process flow.

30. (New) The method of claim 29, wherein the compensated measurement signal is determined by $Q_{\text{comp}} = Q_{\text{meas}}(1 - R\phi)$, where Q_{comp} is the compensated measurement signal, Q_{meas} is the measurement signal, R is a compensation factor and ϕ is the gas volume fraction of the process flow.

31. (New) The apparatus of claim 30, wherein the compensation factor is 1.4.

32. (New) The method of claim 22, wherein the process flow is one of a liquid having entrained gas, a mixture having entrained gas, a liquid-liquid mixture having entrained gas, a liquid-solid mixture having entrained gas, and a slurry having entrained gas.

33. (New) The method of claim 22, wherein the measurement signal is indicative of the volumetric flow of the process flow which is provided by a volumetric flow meter.

34. (New) The method of claim 33, wherein the volumetric flow meter is an electromagnetic flow meter.

35. (New) The method of claim 22, wherein the measurement signal is indicative of the consistency of the process flow which is provided by a consistency meter.

36. (New) The method of claim 35, wherein the consistency meter is a microwave consistency meter.

37. (New) The method of claim 22, wherein the sound measurement signal is provided by a second meter portion that includes at least two strain sensors at different axial locations along the pipe, each of the strain sensors providing a respective strain signal indicative of an acoustic pressure disturbance within the pipe at a corresponding axial position.

38. (New) The method of claim 37, further includes determining a signal indicative of the gas volume fraction of the process flow in response to the strain signals.

39. (New) The method of claim 37, further includes determining the slope of an acoustic ridge in the k - ω plane to determine the sound measurement signal.

40. (New) The method of claim 22, wherein measurement signal is provided by a first meter portion includes at least two strain sensors at different axial locations along the pipe, each of the strain sensors providing a respective strain signal indicative of a vortical pressure disturbances within the process flow flowing in the pipe at a corresponding axial position, wherein the processor, responsive to said strain signals, provides a signal indicative of a parameter of the process flow flowing within the pipe.

41. (New) The method of claim 40, wherein the parameter of the fluid is one of velocity of the process flow and the volumetric flow of the process fluid.

42. (New) The method of claim 40, further includes determining the slope of a convective ridge in the k - ω plane to determine the velocity of the fluid flowing in the pipe.